1879MNRAS..39..371L

Note on η Draconis. By W. T. Lynn, B.A. (London).

The *Nautical Almanac* star *η Draconis* appears in the Pulkowa *Catalogue de* 514 *Etoiles doubles et multiples* (published in 1843) as a double star, the components of which, at the distance of 4″, are stated to be of the 2·3 and 8th magnitude respectively.

The large star is contained (repeatedly observed) in all the great Greenwich Catalogues. A single observation of the small star is given in the First Seven-Year Catalogue for 1860 and the Second Seven-Year Catalogue for 1864. But in the first of those catalogues the small star appears to precede the large star by $0^{s}\cdot37$, and in the second to follow it by $0^{s}\cdot32$. Reference, however, to the original observation in the former (which observation was made on 1856, February 16) convinces me that a misunderstanding of its language was fallen into when the observations of that year were compared and reduced, and that the observation printed as referring to the large star really referred to the small one, and *vice versâ*. For the observer, Mr. Criswick, states that the small star was observed in transit over the five last wires and the large star over all the nine wires. Now the star observed over all the wires certainly precedes the other, but (apparently because the R.A., when reduced, of the second star, agrees better than that of the first with the other observations of the large star in that year) it was considered, when the results were put together at the end of the year, that the second star was the large *Nautical Almanac* star, and the star preceding it was the small companion star (which Struve, as above mentioned, calls of the 8th magnitude).

If then we transfer these observations accordingly, we shall find that the R.A. of the large star, from nine Greenwich Transit-Circle observations, is $16^{h}\ 22^{m}\ 2^{s}\cdot98$; that of the small star, from only one observation, $16^{h}\ 22^{m}\ 3^{s}\cdot17$; distance in R.A., $0^{s}\cdot19$. No N.P.D. of the small star was observed that year.

Combining this result with the other observations of the *Nautical Almanac* star in the First Seven-Year Catalogue, we shall find the R.A. in this Catalogue, for the epoch 1860, to be $16^{h}\ 22^{m}\ 6^{s}\cdot21$, instead of $16^{h}\ 21^{m}\ 6^{s}\cdot23$, as there printed. The R.A. of the small star will be $16^{h}\ 22^{m}\ 6^{s}\cdot36$, instead of $16^{h}\ 22^{m}\ 5^{s}\cdot86$. A further reduction in the R.A. of the *Nautical Almanac* star must be made, in consequence of the fact that an erroneous proper motion was used in determining its place in that Catalogue. The R.A. was not observed by Bradley, and the proper motion in the B.A.C. (used in the *Nautical Almanac* until 1873) was determined by a comparison of Piazzi's with later observations. This proper motion amounts to $+0^{s}\cdot023$; but being found to be too large, the *Nautical Almanac*, in 1874 and subsequent years, used $+0^{s}\cdot005$, determined by Mädler. Mr. Downing, in the *Monthly Notices* for last March, made a re-determination, and found it to be $+0^{s}\cdot004$. The *Greenwich Observations* alone would give even

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less than that; and it seems at any rate clear that the proper motion in R.A. is practically insensible. The First Seven-Year Catalogue being reduced to the epoch of the last year (1860), of which the observations are included in it, makes the amount of proper motion used in the reductions of some importance. Assuming that for this star to be insensible, instead of $+0^s{\cdot}023$ per year as actually used, we shall have the R.A. $0^s{\cdot}05$ smaller; so that finally the R.A. of η^2 *Draconis* in that Catalogue should be $16^h\ 22^m\ 6^s{\cdot}16$. It is to be presumed that the *Nautical Almanac*, in calling the star η^2 *Draconis*, considered Groombridge 2345, which precedes it by about 10^s and is of $11'$ less N.P.D., to be η^1 *Draconis*.

It will be seen that the small star, in the Second Seven-Year Catalogue (where it is numbered 1869), follows the *Nautical Almanac* star by $0^s{\cdot}32$.

I may mention that my attention was directed to this star by a remark of Professor Bredichin in the fifth volume of the *Annales* of the Observatory of Moscow, that the *Nautical Almanac* R.A. of it, some years ago, was more than $0^s{\cdot}3$ in error. I here give the comparison between the R.A. in the successive Greenwich great Catalogues and the *Nautical Almanac* R.A. for the same epochs, correcting that of the First Seven-Year Catalogue as above:—

Catalogue.	Epoch.	R.A. in Greenwich Cat.	R.A. in *N.A.*	Error of *N.A.*
		h m s	h m s	s
Twelve-Year Cat.	1840	16 21 50·23	16 21 50·09	−0·14
Ditto do.	1845	16 21 54·19	16 21 54·32	+0·13
Six-Year Cat.	1850	16 21 58·14	16 21 58·42	+0·28
First Seven-Year Cat.	1860	16 22 6·16	16 22 6·62	+0·46
Second Seven-Year Cat.	1864	16 22 9·25	16 22 9·91	+0·66
Nine-Year Cat.	1872	16 22 15·66	16 22 16·11	+0·45

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